

# Quality of life measurement in patients with oesophageal cancer

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## Abstract

**Quality of life (QOL) measurement may aid decision making in the treatment of patients with oesophageal cancer but must be clinically valid to be useful. This study considered if the European Organisation for Research and Treatment of Cancer QOL questionnaire, the QLQ-C30, showed differing results in two clinically distinct groups of patients with oesophageal cancer and also investigated the correlation between dysphagia grade and various scales of QOL. Patients treated by oesophagectomy reported significantly better physical, emotional, cognitive, and global health scores than those in the palliative treatment group. Patients who received palliative treatment had significantly worse pain, fatigue, appetite loss, constipation, and dysphagia. The correlations between dysphagia grade and each of the QOL scales and items in both groups of patients were poor. This questionnaire differentiates clearly between the two clinically distinct groups of patients, but to be an entirely appropriate indicator of QOL in patients with oesophageal cancer, an additional specific oesophageal module including a dysphagia scale is required.**

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Keywords: quality of life, oesophageal cancer, dysphagia.

The treatment of oesophageal cancer is controversial and poses an important therapeutic challenge. About 50% of patients will have resectable disease, rendering them suitable for potentially curative surgery.<sup>1,2</sup> These patients face a 5% perioperative death risk, morbidity rates in the region of 10-30%, and an overall five year survival between 10 and 36%.<sup>2-5</sup> The role of major surgery in patients with advanced disease is questionable, although it is widely held that an increase in survival may be achieved by this aggressive approach.<sup>6</sup> Those deemed inappropriate for surgical resection may be palliated by a variety of endoscopic procedures, radiotherapy or chemotherapy. Survival is often poor in these patients, averaging between three and five months.<sup>7,8</sup> Because of the morbidity and mortality associated with any of these interventions, both quantity and quality of survival after treatment must be important. Most authors concentrate on death rates and morbidity data as key outcome measures,<sup>4,5</sup> but a growing body of opinion considers that a measure of the broader effects

of ill health and treatment on the patient's quality of life (QOL) is necessary.<sup>9-11</sup>

Although there is no strict definition of the elements that contribute to health related QOL it is generally accepted that they include physical, social, and psychological aspects.<sup>12,13</sup> Few studies have examined these wider issues in patients with oesophageal cancer and many have presumed that the commonest presenting symptom, dysphagia, is the overwhelming influence on the patient's QOL.<sup>1,4,14,15</sup> One of the best validated measures of QOL in patients with cancer is the European Organisation into Research and Treatment of Cancer (EORTC) core questionnaire, QLQ-C30, a generic instrument designed for international clinical oncology trials.<sup>16</sup> Results of its use in patients with a heterogeneous diagnosis of cancer have been reported,<sup>17,18</sup> but it is not known whether this self completion instrument is applicable to patients with oesophageal cancer, as there are currently no data available about its use in this group of patients, neither does it contain questions regarding difficulty with swallowing.

This study therefore had two objectives: the evaluation of the EORTC QLQ-C30 questionnaire as an appropriate QOL measure for patients with oesophageal cancer and an assessment of the correlation between QOL scales and dysphagia grade.

## Methods

### Patient details

Seventy seven consecutive patients were treated for oesophageal cancer in a 12 month period beginning August 1993. Forty underwent oesophagectomy and 37 received palliative treatment. Eight patients died within 30 days of intervention, four in each group. Ten patients were excluded (three post-oesophagectomy, seven post-palliative treatment) because they were unable to understand and therefore complete the questionnaire, as a result of mental confusion or medicinal side effects. The remaining 59 patients (33 post-oesophagectomy and 26 post-palliative treatment) were visited at home and asked to complete the EORTC QLQ-C30 questionnaire. The interviewer (JMB) sought the answers to any omitted questions to avoid missing data. Three patients from the oesophagectomy group and 12 patients in the palliative treatment group required some prompting and clarification from the researcher to complete the questionnaire.

Patients underwent oesophagectomy if they were fit for surgery and there was no pre-operative evidence of distant metastases (group 1).

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TABLE I Details of patients in the oesophagectomy group, group 1 and patients in the palliative treatment group, group 2

	Group 1 (n=33)	Group 2 (n=26)
Median age (interquartile range)	64 (62-76)	72 (68-79)
Sex (male/female)	19/14	16/10
Tumour histology		
Adenocarcinoma	19	15
Squamous cell carcinoma	14	11
Metastases	1	16
Medical problems	2	13
Social class distribution		
I & II	10	5
III	11	10
IV & V	12	11
Median follow up in weeks (interquartile range)	16 (10-24)	14 (4-24)
Help with questionnaire	3	12

Other patients underwent intubation alone or in combination with radiotherapy (group 2). This preselection produced two clinically distinct groups (Table I). In group 1 patients were younger, only one had known evidence of metastases at the time of the interview, and two had severe co-morbid disease. In group 2, 16 had metastases and 13 severe cardiorespiratory illnesses. Both groups were similar in sex and social class distribution. The assessments were carried out at similar times after intervention: group 1 median 16 weeks (interquartile range 10 to 24) and group 2 median 14 weeks after intervention (interquartile range 4 to 24).

#### Quality of life assessment

The EORTC QLQ-C30 core questionnaire incorporates five functional scales, a global health scale and three symptom scales, each containing between two and five items. Six single items assess additional symptoms commonly found in patients with cancer, as well as the perceived financial impact of the disease and treatment. For all questions, patients are asked to respond in terms of how they were feeling during the previous week. Further methodological details underlying the construction of this questionnaire are described elsewhere.<sup>19-21</sup> Scoring algorithms have been produced by the EORTC Quality of Life Study Group. All scale and item scores are linearly transformed such that scales range from 0 to 100.<sup>16</sup> In the functional scales a high score is equivalent to better function, whereas in the symptom scales and single items a high score means more symptoms.

#### Dysphagia

The interviewer graded the patient's swallowing over the previous week, on a scale of 0 to 4:

0=normal food intake, 1=difficulty with swallowing some solids, 2=able to swallow only soft food, 3=able to swallow liquids only, 4=complete dysphagia. These scores were linearly transformed to range from 0 to 100 such that dysphagia results could be compared more easily with the QOL scales.

#### Statistical analysis

The differences seen between the two groups were examined using the Mann-Whitney U test. Spearman rank correlation coefficients examined any linear association between dysphagia grade and QOL scales in each group of patients. Because multiple significance testing was used, only a p value less than 0.01 was classed as representing a significant difference.<sup>22</sup>

#### Results

##### Quality of life

Of the 59 patients available for the study there was a 100% response. The median scores and interquartile ranges of the functional and the symptom scales and items in both groups are shown in Table II and III respectively. Group 2 reported poorer function and more symptoms than group 1. Statistically significant differences were found between the groups with respect to physical, emotional, and cognitive functioning scores ( $p < 0.01$ ). Patients in group 2 who had received purely palliative treatment reported significantly worse global health scores than those in group 1 ( $p < 0.01$ ) and significantly worse pain, fatigue, appetite loss, and constipation symptom scores ( $p < 0.01$ ).

##### Dysphagia

Table III shows that the dysphagia score was statistically significantly higher (worse) in those who had palliative treatment ( $p < 0.001$ ). Tables IV and V show that the correlation coefficients between the dysphagia grade and each functional scale and symptom scale and item were poor for both groups. Dysphagia was not significantly correlated with any of the QOL scales or items at the 1% level.

#### Discussion

The incidence of oesophageal cancer is increasing in England and Wales<sup>23 24</sup> and a wide variety of potentially curative and palliative treatment options exist.<sup>25-30</sup> There is currently no clear answer as to the best way to treat this distressing disease and therefore the evaluation of all treatments should include a validated, reliable, and appropriate QOL measure.

This study shows that the EORTC QLQ-C30 questionnaire is responsive to gross differences in severity of the disease, as, frail patients with metastases reported worse functional and symptom QOL scores than younger patients treated with potentially curative surgery. These differences were statistically significant at the 1% level in some but not all scales. A larger

TABLE II Median scores and interquartile ranges of functional and global health scales

	Group 1 (n=33)	Group 2 (n=26)	Median difference (95% CI)	p Value (Mann-Whitney)
<i>Function scales</i>				
Physical	60 (40-100)	40 (20-60)	20 (20 to 40)	0.001
Role	50 (0-100)	50 (0-50)	0 (0 to 50)	0.068
Emotional	92 (67-92)	62 (33-75)	25 (8 to 41)	0.002
Cognitive	83 (83-100)	50 (33-67)	33 (17 to 50)	<0.001
Social	67 (33-83)	42 (17-67)	16 (0 to 33)	0.186
Global health	50 (33-67)	29 (17-42)	17 (8 to 33)	0.004

High score=better function. CI=confidence intervals.

TABLE III Median scores and interquartile ranges of symptom scales, symptom items, and dysphagia grade

	Group 1 (n=33)	Group 2 (n=26)	Median difference (95% CI)	p Value (Mann-Whitney)
<i>Symptom scales</i>				
Pain	16 (0-33)	50 (16-66)	-33 (-50 to -16)	0.002
Fatigue	33 (22-56)	78 (33-100)	-33 (-56 to -11)	<0.001
Emesis	17 (0-33)	42 (0-67)	-17 (-50 to 0)	0.049
<i>Single items</i>				
Dyspnoea	33 (0-33)	33 (33-66)	0 (-33 to 0)	0.462
Trouble sleeping	33 (0-33)	33 (0-66)	0 (-33 to -0.01)	0.118
Appetite loss	33 (0-66)	83 (66-100)	-34 (-66 to -33)	<0.001
Constipation	0 (0-33)	33 (33-100)	-33 (-34 to -0.01)	<0.001
Diarrhoea	0 (0-33)	0 (0-0)	0 (-0.01 to 0)	0.118
Financial impact	0 (0-33)	0 (0-33)	0 (-0.01 to -0.01)	0.713
<i>Dysphagia grade</i>				
Dysphagia	25 (25-25)	50 (50-75)	-25 (-50 to -25)	<0.001

High score=more symptoms.

study may show more significant differences as patients treated palliatively had consistently poorer function and more symptoms. It is unlikely, however, that the QLQ-C30 questionnaire alone, would be able to detect small differences between treatments that aim primarily at restoring swallowing ability. This would require the addition of a dysphagia scale and other questions concerning eating.

Dysphagia grade did not correlate significantly at the 1% value with any of the QOL scales or items in either group of patients. Others have measured dysphagia grade and QOL simultaneously and found conflicting results. Van Knippenberg *et al* adapted the Rotterdam Symptom Checklist<sup>31</sup> to include a dysphagia and eating scale for Dutch patients undergoing surgery. Relatively poor correlations were found between swallowing scores and global quality of life ( $r_s=0.36$  pre and  $0.16$  post-operatively).<sup>32</sup> Loizou *et al* studied patients with locally invasive or metastatic disease and found higher correlations,<sup>33</sup> although compliance rates in their QOL assessments were poor (52%). They used an administered questionnaire, the Spitzer Quality of Life Index,<sup>34</sup> and a Linear Analogue Scale.<sup>35</sup> In another study Barr *et al* randomised patients with advanced disease to receive laser treatment alone or laser followed by intubation.<sup>36</sup> They used the same QOL measures as Loizou *et al*. Spearman's rank correlations between these measures and the results of a daily dysphagia diary kept by the patients were significant at the 0.005 value, but they were modest in magnitude, 0.27 with the Linear Analogue Scale and 0.43 with the Quality of Life Index. These results are not conclusive, but they generally show that dysphagia does not determine all aspects of QOL and that other issues should be measured separately.

In this study dysphagia was graded by one researcher (JMB) using a consistent definition,

TABLE IV Spearman rank correlation coefficients ( $r_s$ ) between dysphagia grade and each functional and global QOL scale

	Group 1 $r_s$ (p value)	Group 2 $r_s$ (p value)
Physical	-0.35 (0.04)	-0.29 (0.15)
Role	-0.22 (0.22)	0.06 (0.78)
Emotional	0.03 (0.87)	0.19 (0.36)
Cognitive	-0.10 (0.59)	-0.12 (0.57)
Social	-0.30 (0.09)	-0.23 (0.27)
Global QOL	-0.24 (0.18)	-0.23 (0.27)

TABLE V Spearman rank correlation coefficients ( $r_s$ ) between dysphagia grade and each symptom QOL scale and item

	Group 1 $r_s$ (p value)	Group 2 $r_s$ (p value)
Pain	0.20 (0.27)	0.25 (0.24)
Fatigue	0.26 (0.15)	0.30 (0.14)
Emesis	-0.19 (0.28)	0.21 (0.30)
Dyspnoea	-0.14 (0.43)	-0.03 (0.90)
Trouble sleeping	-0.39 (0.02)	0.45 (0.02)
Appetite loss	0.23 (0.20)	0.44 (0.03)
Constipation	0.20 (0.28)	0.22 (0.29)
Diarrhoea	-0.17 (0.33)	-0.14 (0.50)
Financial impact	-0.18 (0.32)	0.21 (0.31)

but a valid and reliable self-completion eating scale may prove a better instrument. It is of interest that the highest negative correlation ( $r_s=-0.39$ ), was found in the sleep scale in group 1 and the highest positive correlation ( $r_s=0.45$ ) was found in the same scale in group 2. The positive correlation between dysphagia and difficulty in sleeping in patients undergoing palliation alone may not be surprising, however, the negative correlation after oesophagectomy merits further comment. One explanation might be that patients with a worse dysphagia grade report less sleep difficulty, because regurgitation of intrathoracic stomach contents is prevented by anastomotic narrowing. In general dysphagia was negatively correlated with the functional scales and positively correlated with the symptom scales but a larger study is required to test the strength of the associations.

The EORTC QLQ-C30 questionnaire for patients with cancer has been developed with a modular approach. This strategy allows the core questionnaire to be sufficiently general to permit cross study comparisons. A tumour specific module should provide additional specificity to consider questions of particular relevance in a given clinical trial.<sup>16</sup> This study has shown that the EORTC QLQ-C30 core questionnaire distinguishes clearly between two clinically distinct groups of patients with oesophageal cancer, but because no correlation was established with dysphagia grade, the patients' predominant symptom, the questionnaire requires extra questions. The addition of a validated oesophageal cancer specific module, as recommended by the EORTC Quality of Life Study Group, should improve its specificity and permit detection of even small benefits accrued from new palliative or adjuvant treatments. Such a module would include not only assessment of dysphagia but additional QOL related problems volunteered by patients with oesophageal cancer.

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